

Increased Capital Mobility and Financial Crisis

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Regarding the consideration that the short/intermediate run effect of capital movement is more important than that of the long run, this paper exposes a dark side of crisis generation by employing a few features discussed in the literature on financial crises. By means of a simple *IS-LM* type model it examines to macro economy the effects of such factors as self-fulfilling pessimism, balance sheet effect, contractionary effect of devaluation and vicious circle tossed in the context of financial crisis. Policy implications related with the dark side of international capital movement, in distinction to the naïve optimism of the neoclassical model are as follows: Currency mismatch can be avoided to get rid of balance sheet effect due to high indebtedness, stabilization of exchange rate can be attempted as it would obviate the malicious pessimism of self-fulfilling exchange rate expectation, the most severe loss in net worth activating the balance sheet problem usually arises with the severe depreciation, capital movement can be somehow managed to overcome sudden stops and hence avoid malicious depreciation.

Keywords: Capital mobility, Balance sheet effect, Self-fulfilling expectation, Contractionary effect of devaluation, Capital account crisis, Sudden stop

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I. Introduction

The purpose of this paper is to disclose the relation between a few features associated with increased capital mobility and financial

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crises, with increased capital mobility treated as exogenous. Capital mobility has increased with globalization. It has potentially enhanced the allocative efficiency of capital on a global scale, but at the same time appears to have contributed to bringing many financial crises. It thus has two kinds of effects, one positive and the other negative. But it looks the conflicting effects have been considered separately, the positive bright side one time and the negative dark side the other time.

In differentiating the two separate views, the length of time implicitly involved in the argument seems critical. In other words, in the long run the capital movement seemed to enhance allocative efficiency, whereas in the short and intermediate run it appeared to have facilitated financial crises. Regarding the consideration that the short/ intermediate run effect is more important than that of the long run due to the heavy cost of financial crises, this paper intends to expose a dark side of crisis generation by employing a few features discussed in the literature of financial crisis. By means of a simple *IS-LM* type model it examines to macro economy the effects of such factors as self-fulfilling pessimism, balance sheet effect, contractionary effect of devaluation and vicious circle in the context of financial crisis. It attempts to derive policy implications related with the dark side of international capital movement, in distinction to the naïve optimism of the neoclassical model which entails only the efficiency enhancing effect of capital movement.

II. Optimism in the Neoclassical Model

Neoclassical theory of capital movement has shown the gains from international capital movements between two countries, each endowed with different amounts of capital with their respective schedules of marginal productivity of capital. It has demonstrated that, through the capital movement that resulted in a single interest rate interrelating the two countries of capital transaction, both parties could gain; the lender one by obtaining the gain defined by the interest rate which was made higher by lending than the marginal productivity of capital it could get without lending, and the borrower by obtaining the gain defined by the marginal productivity of capital realized after borrowing which was bigger than the interest rate it paid on the contracted capital. In other words, it has revealed the

gains from international capital movement through efficient allocation of capital between the two countries.

It can be said that this theory has only demonstrated the potential gains from international capital movement on the presumptions that the common interest rate prevails in the capital transaction between the two countries. For the gain to materialize, however, enough time has to be guaranteed after the capital movement to yield the supposed alteration of marginal productivity in the two areas through the alteration of capital stocks actually employed in the production deviated from their respective initial endowments by the amount of capital moved. In this sense, this theory is timeless as it does not consider the time elapsed between the initial date of capital movement to the other country and the return of it later having finished the production contracted, whereas in the real world many changes can occur in either of the two countries during the time between the capital flow-in and flow-out.

Considered in another perspective, the neoclassical theory is about the potential gains from international capital movement, but does not address the distribution of the gains from it between the two economies in the mean time between capital flow-in and capital flow-out. Specifically, due attention is not given to the possibility that one of the parties involved in the international capital movement could be worse off, probably falling into a crisis.

In the reality of capital movement, in contrast to the neoclassical theory, there is no guarantee that its suppositions of the above will prevail at all times. Some capital that once moved to another country can return before its gestation period without completing the production planned and the associated enhancing of productivity. Hot money can disrupt the whole economy before it somehow materializes in the enhancement of capital productivity. Among the many cases of capital movement the common interest rates may not be realized; the interest rates could be different among alternative cases of capital movement, and especially in the cases of portfolio capital movement the interest rate of a certain contract may not have an exact relation with the marginal productivity of the capital at issue (as the marginal productivity is hard to measure and thus difficult to apply in the implementation of direct investment on the one hand and interest rates are mostly determined in financial dealings with greater variability on the other).

Due to the deviation of real world practices from the neoclassical

model showing the potential gains from international capital movement, there are substantial uncertainties in the real world as to the distribution of the gains from the international capital movement when the actual substance of capital movement differs from that of the neoclassical picture.

Besides, there are some complaints on international capital movements, negating the optimism about the international capital movement of the neoclassical model. The loss of jobs is regarded as being caused by the outflow of capital and associated production facilities with it overseas is a serious concern nowadays in many advanced countries. A speculative attack often leading to a financial crisis invokes an antagonism toward short-term capital flows in many developing countries. In view of these complaints, especially the latter in the context of financial crises that are supposedly caused by speculative capital movement in the short/intermediate run, it is important to reexamine the undesirable effects associated with short-term speculative capital movement rather than to be pleased with its benefit from better resource allocation, taking into account such features of international capital flows as self-fulfilling expectation, balance sheet effect and others recently appraised critical.

In section III, the causes of financial crises pointed out in the literature in broad relations with capital movement are recast to determine how the recent increase in capital mobility affected financial difficulties. Various causes more or less related with increased capital mobility are mentioned. In section III, a formal model is used to address the various causes of crises thus far mentioned in the literature. Final observations are made in section IV.

III. Causes of Financial Crises

Financial crises are diagnosed to have many causes. Earlier ones pointed bad internal economic policies that were incompatible with surrounding fundamentals, such as excessive budget deficits or money supply aiming at too much seigniorage under circumstances in which the exchange rate was more or less pegged.

A notable feature of recent international capital movement is that the degree of capital mobility has increased with the recent development of globalization. Indeed, some have claimed that recent financial crises since 1997 Asian crisis were greatly affected by the

enhanced movement of capital in the globalization, as emphasized by studies pointing that recent crises are of capital account crisis rather than of current account crisis. Increase in capital mobility in principle implies a convergence of the domestic interest rate to foreign interest rate under the assumption of a competitive international capital market. In the context of a financial crisis owing to a speculative attack made more frequent through the increase in capital mobility, however, the convergence may not be automatically guaranteed. Foreign capital may involve speedier movement and thereupon have a larger effect on the interest rate than domestic capital, which is usually less mobile. Consequently, various misgivings may occur prior to the convergence of the two interest rates.

A sudden reversal of international capital flows is noted to be the factors for a financial crisis of an economy with a weak financial sector. It is regarded especially so when they were associated with or motivated by self-fulfilling pessimism, in the sense that the exchange rate depreciates without any fundamental cause once the exchange rate is expected to depreciate, say, in view of unanticipated capital outflow. Besides, the self-fulfilling expectation (or pessimism) can lead to a running away from domestic demand. The self-fulfilling expectation is validated, especially in the condition of huge loss in net worth in the balance sheet from a depreciation caused by an unfavorable development in the external environment such as a sudden stop in capital inflow. At the extreme, it can trigger a vicious circle as depreciation leads to an expectation of depreciation, and then, the expectation brings in depreciation, and so on. This result suggests that the mechanism is welcome whenever rapid adjustment of exchange rate is desirable, but not so when it accompanies much worse outcome involving rapid alterations mixed with the balance sheet effect, and thereafter induces a fall into crisis.

The balance sheet effect occurs when some demand element depends critically on the changes in the relative prices of assets and liabilities in the balance sheet. For example, when many firms are highly leveraged and a substantial part of their debt is denominated in foreign currencies, their net worth in the balance sheet is seriously deteriorated with a depreciation of their domestic currency, and thereupon their investment will be constrained by their balance sheet.

The balance sheet effect magnifies the initial price effect (such as the exchange rate effect) of adverse external shocks, and therefore it was noticed as a critical factor creating the potential of financial

crises, especially in an economy with a fragile financial sector and high indebtedness mainly composed of foreign currency denominated liabilities.

It is noteworthy that the balance sheet effect depends on the level of exchange rate and therefore can invite a so-called contractionary effect of devaluation. Indeed, as Krugman (2001) observes, at very favorable exchange rates, few firms would be balance-sheet constrained; so at low real exchange rate the direct effect of exchange rate on aggregate demand would be minor. In addition, at very unfavorable real exchange rates, firms with foreign-currency denominated debt would be unable to invest at all, and therefore the direct exchange-rate effect on demand would be trivial at the margin. But in an intermediate range, the effect might be large enough to outweigh the direct effect on export competitiveness, so that over that range a depreciation of the currency would be contractionary rather than expansionary.

IV. Basic Model

The economy is described by two equations, one for the real sector and the other for the monetary sector.

In the real sector $GDP(y)$ is determined by the aggregate demand consisting of domestic demand $D(\cdot)$ and net export $NX(\cdot)$. The domestic demand depends on $GDP(y)$, real exchange rate (EP^*/P) and expected exchange rate (\hat{E}) , where E is nominal exchange rate, P^* is foreign price level and P is the domestic price level. The net export depends on the real exchange rate and GDP , as usual. In the monetary sector money demand depends on real exchange rate, GDP and the expected exchange rate, and equated to money supply M . The expected exchange rate is assumed to affect $D(\cdot)$ and $L(\cdot)$ only in the case in which self-fulfilling pessimism plays its role of diverting effective demand from domestic goods and money. Hence, the two equations are respectively given by

$$Y = D(y, EP^*/P, \hat{E}) + NX(EP^*/P, y) \quad (1)$$

+ - (?) - + +

and

$$M/P = L(EP^*/P, y, \hat{E}) \quad (2)$$

+ + -

In the above equations the signs +, - or ? indicate the direction of the respective partial derivatives, with ? implying some ambiguity in the relation.

A few concerns associated with the recent increase in capital movements such as the balance sheet effect, self-fulfilling expectation, and vicious circle have been incorporated into this simple model. Firstly, the balance sheet effect was brought into the picture, where it involved the feature that the exchange rate depreciation reduced the net worth and the net worth of the balance sheet determined the ability to invest. Accordingly, a highly indebted economy with large foreign debts could be severely affected by a depreciation due to this channel as reflected in the negative sign of EP^*/P . Secondly, the self-fulfilling pessimism was included as \hat{E} . It would make the degree of depreciation larger when the depreciation is not regarded as favorable. Thirdly, as shown shortly, the exchange rate was associated somewhat loosely but inversely with interest rate through the uncovered interest parity theorem, $1+i=(1+i^*)\hat{E}/E$, where i is domestic interest rate, \hat{E} is expected exchange rate, E is nominal exchange rate and i^* is foreign interest rate. The relation between interest rate and exchange rate is not straightforward, as usual, but the uncovered interest parity suggests that they are inversely related. According to the interest parity relationship the return from domestic investment of 1 won $(1+i)$ is equal to the return from foreign investment of 1 won $(1+i^*)\hat{E}/E$. Hence, when foreign interest rate and expected exchange rate are unchanged, domestic interest rate has the tendency to fall when the exchange rate depreciates. It rationalized the positive sign of partial derivative of EP^*/P in $L(\quad)$. Fourthly, the exchange rate should move upward when self-fulfilling pessimism steps in with adverse external shocks such as a sudden stop in capital inflow or a oil price hike. Fifthly, there is a possibility of contractionary effect of devaluation, namely, domestic demand is decreased with the rise in exchange rate, and thereafter it overwhelms the increased net export by depreciation, when the ? sign standing for the real exchange rate assumes a strong negative value.

The economy summarized by equations (1) and (2) is depicted by the solid curves of IS and LM respectively in Figure 1. In $(EP^*/P, y)$ space, the IS curve is positively sloped; as an increase of E is considered to raise net export and thereupon the aggregate demand under normal situation with functioning Marshall-Lerner condition, while an increase of y is to result in larger aggregate supply. In

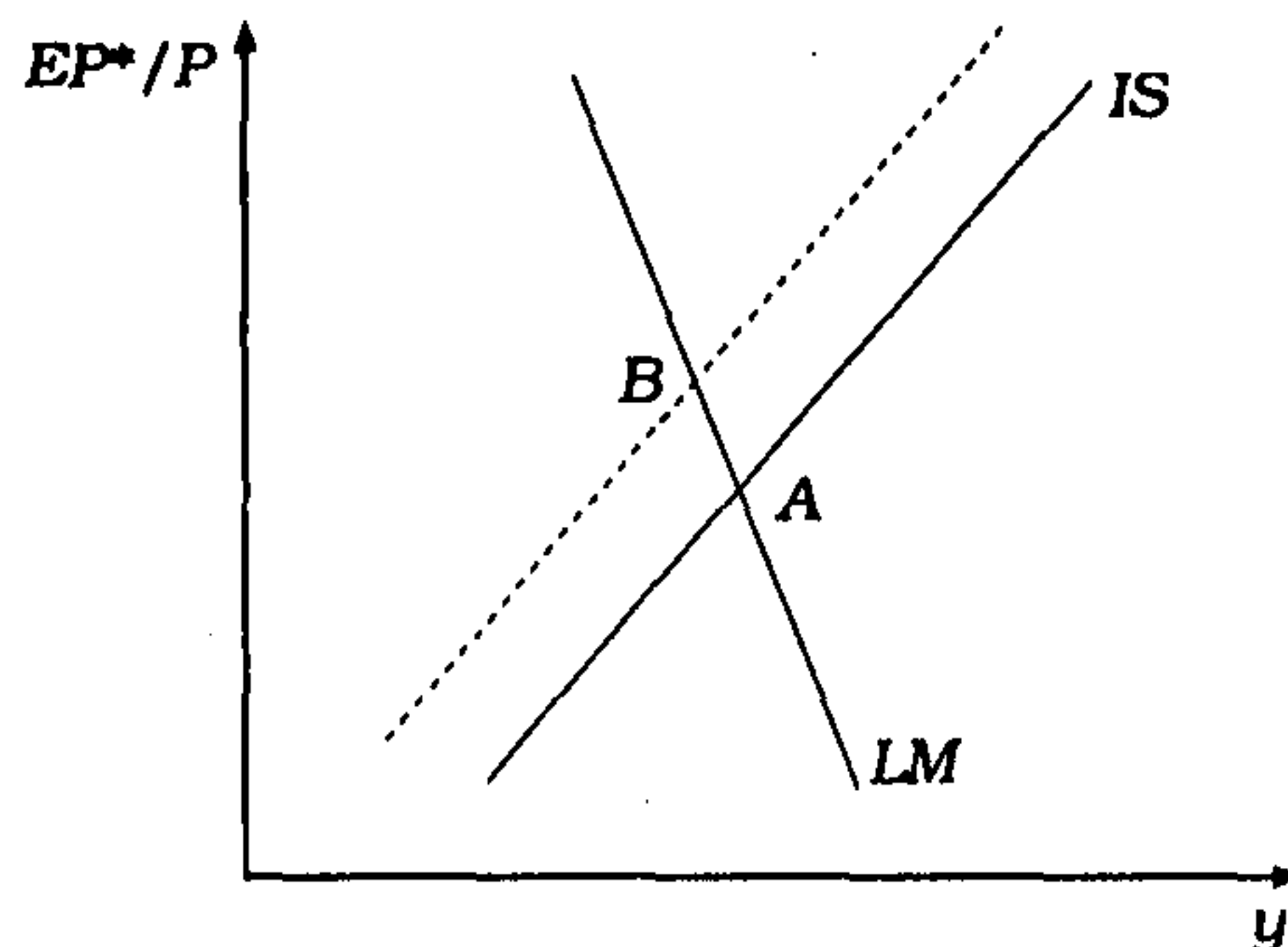


FIGURE 1

abnormal situation in which the so-called contractionary effect of devaluation is relevant, however, the domestic demand $D(\)$ is greatly decreased with a rise in exchange rate and it dominates the effect of the increase in aggregate demand owing to the increase in net export. Therefore, in the abnormal situation the IS curve could be negatively sloped.

The LM curve is positively sloped, as an increase of exchange rate decreases the interest rate and thus money demand due to the aforementioned reason based on uncovered interest parity, while a rise in y increases the money demand. However, the relation between the interest rate and exchange rate is not strongly unambiguous, and therefore the effect of the exchange rate on money demand is considered to be of minor importance quantitatively, and thus reflected in the steep LM curve.

Now, let us examine the effect of a sudden stop in capital inflow in a normal situation, recalling that the main cause of recent financial crises is regarded as capital account crisis rather than current account crisis. The sudden stop involves a restructuring of investment plans in the domestic economy hinting a hardship. Hence, its effect can be depicted by a leftward shift in the IS curve in Figure 1. The exchange rate is depreciated and GDP is reduced with the worsening scene initiated by the sudden stop.

Monetary expansion shifts the LM curve rightward momentarily, but sooner or later it would invite a rise in both P and E , returning

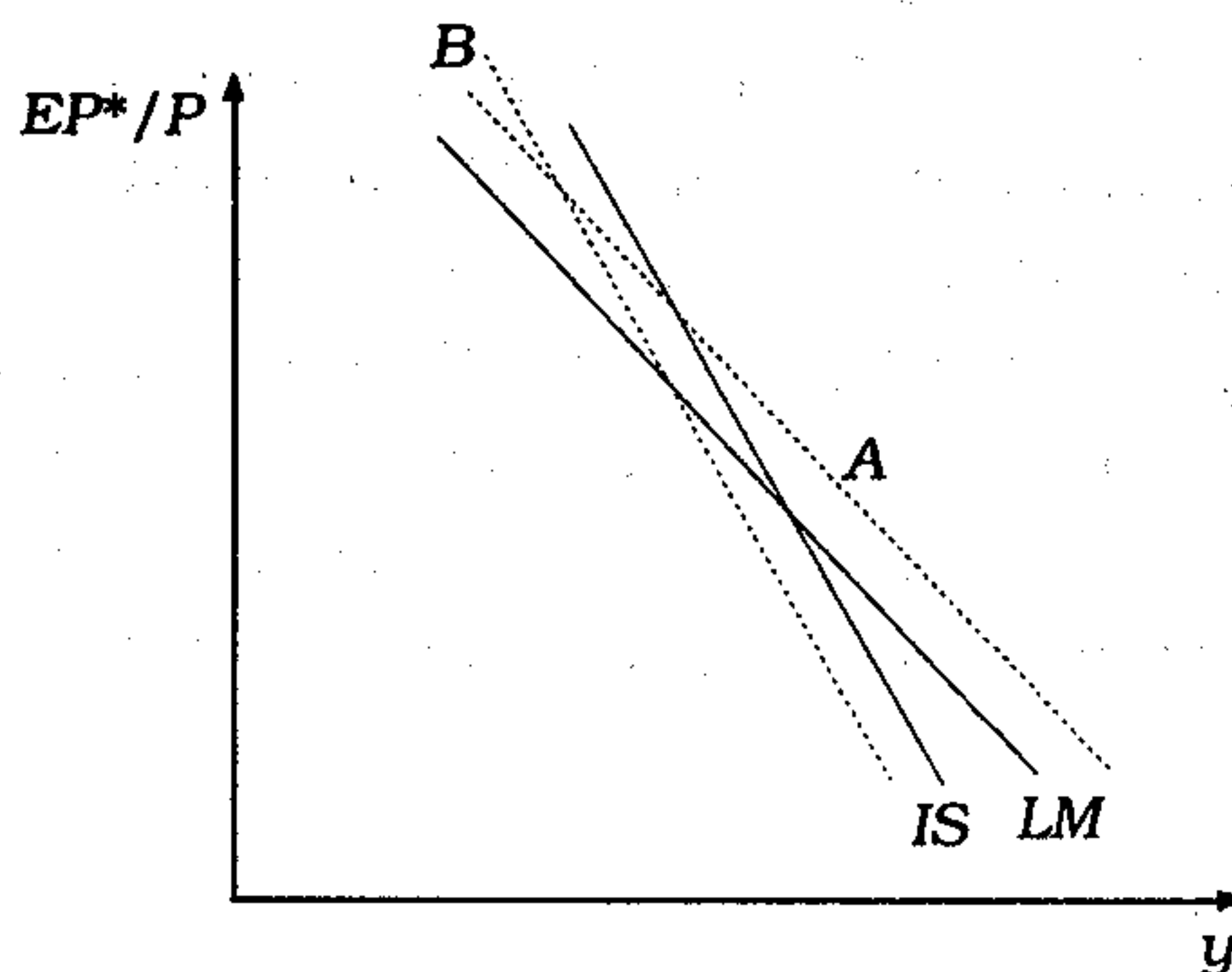


FIGURE 2

the shifted *LM* curve backward. The neutrality of money may be obtained not only in the long run but in the short and intermediate run when *P* and *E* are very flexible. The impotence of monetary policy in the face of a capital account crisis and a flexible price regime is confirmed.

In abnormal situations in which the contractionary effect of devaluation is relevant, in contrast, the *IS* curve is made to have a negative slope as depicted in Figure 2. In this case of the negatively sloped *IS* curve, a sudden stop in capital flow that is of the same magnitude as that of the normal case would bring about a decrease in *y* of a larger magnitude than that of the normal situation, but a much larger rise in exchange rate. The shock to the domestic economy from sudden stop is relatively larger in abnormal case than that of normal case. The slope of negatively sloped *IS* curve cannot be made to be more negative exceeding that of *LM* curve, as in that case an increase in money supply would imply an appreciation, counter to usual intuition. Implicit stability consideration might exclude this case.¹

In addition, the self-fulfilling pessimism associated with considerable depreciation can be brought into the picture to induce a run away from domestic demand in the real sector and also from domestic

¹The slope of negatively sloped *IS* curve cannot be made to be more negative exceeding that of *LM* curve, as in that case an increase in money supply would imply an appreciation, counter to usual intuition. Implicit stability consideration might exclude this case.

demand for money in monetary sector as depicted with the negative partial derivatives under E in $D(\)$ and $L(\)$, respectively. Hence, when the self-fulfilling expectation is taken into account, the IS curve is made to shift further leftward and the LM curve is made to shift rightward, resulting in a further rise in EP^*/P and a further fall in y . This process can go on continuously demonstrating a vicious circle. In abnormal situations a small stop in capital inflow can cause serious damages if appropriate remedies are not taken immediately.

V. Final Remarks

Consistent with other works on financial crises, the monetary policy of changing domestic money supply M which shifts LM in Figure 1 rightward is more or less useful in increasing y and exchange rate E in normal situation. However, when the situation is abnormal with unfavorable balance sheet effect and dangerous self-fulfilling pessimism it is entirely unhelpful as the rise in M in Figure 2 shifts LM rightward, triggering depreciation first and vicious circle thereafter. Accordingly, the suitable remedies should entail the mitigation/offsetting effect of the adverse development associated with capital account crisis, rather than the traditional monetary policy. In this regard, the following policies seem appropriate. Firstly, currency mismatch can be avoided to remove the balance sheet effect due to high indebtedness. Secondly, stabilization of the exchange rate can be attempted as it would obviate the malicious pessimism of self-fulfilling exchange rate expectation. A currency board system or dollarization could be helpful in this context as far as the abnormal situation is not acute enough to negate either of these two extreme systems. Thirdly, the most severe loss in net worth that triggers the balance sheet problem usually arises with severe depreciation. But it is not the only cause and other elements in the balance sheet can be utilized to mitigate the adverse effect of depreciation and loss in net worth. For example, injection of internal public money to strengthen the balance sheets of companies could considerably alleviate the fall in net worth owing to depreciation. Fourthly, capital movement can somehow be managed to overcome sudden stops and hence avoid malicious depreciation.

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References

- Allen, M., Rosenberg, C., and Roubini, N. A Balance Sheet Approach to Financial Crisis. IMF Working Paper, WP/02/210.
- Calvo, G. Explaining Sudden Stops, Growth Collapse and BOP Crisis: The Case of Distortionary Output Taxes. 2002 Mundell-Fleming Lecture, IMF Annual Research Conference.
- Edwards, S. Financial Openness, Sudden Stops and Current Account Reversals. NBER Working Paper, No. 10277, 2004.
- Eichengreen, B., and Hausmann, R. Exchange Rates and Financial Fragility. NBER Working Paper, No. 7418, 1999.
- Eichengreen, B., and Leblang, D. Capital Account Liberalization and Growth: Was Mahthir Right? NBER Working Paper, No. 9427, 2002.
- Krugman, P. Crises: The Next Generation. Mimeograph. 2001.
- Oliver, J., and Zettelmeyer, J. Original Sin, Balance Sheet Crises, and the Roles of International Lending. IMF Working Paper, WP/02/234.